

Supplemental Information for the I- 81 PPTA Advisory Panel

A.1 Rail Issues

Provide the underlying analysis for, and expected results from your proposed rail investment.

Fluor will invest in the best rail solution. It will be the most practicable solution as well as the most economically and environmentally efficient approach. This solution will represent the most acceptable means of maximizing the diversion of freight from truck to rail in serving the I-81 corridor. Although driven by the potential demand for freight diversion, the Fluor proposal will advance the interests of passenger rail. It will also provide new facilities or free up existing facilities for additional passenger trains. We have not proposed to fund directly, or to extend directly, any passenger service out of toll revenues; however, our proposal benefits passenger rail by providing more rail facilities which may be used by passenger trains as well as freight trains.

Fluor Phase I Improvements

Fluor Phase I improvements to rail will double the capacity of a highly constrained stretch of Norfolk Southern (NS) tracks from the West Virginia state line to a location approximately three miles south of Manassas. North of Riverton Junction, this line functions as an extension of the Shenandoah line extending north to Harrisburg, PA, and beyond. The improvements that will occur east of Riverton Junction will connect the Shenandoah line to the Piedmont line, the latter being a high-capacity, high-speed line. This line will extend through Charlottesville, Lynchburg and Charlotte, to Atlanta, where it connects with lines to Birmingham, Meridian, New Orleans, Chattanooga, and Memphis. It will also provide connections with other carriers, most notably the Kansas City Southern in Meridian, and the Burlington Northern Santa Fe and Union Pacific in other cities. The importance of this network is that it parallels and extends the northeast-southwest corridor of I-81, and makes it possible for NS to compete for freight, which would otherwise utilize I-81 in Virginia. Enabling NS to better compete for freight by upgrading this bottleneck will divert freight from I-81, into a parallel corridor approximately 100 miles to the southeast, or two hours by truck. In fact, the Atlanta to Chattanooga rail route provides a

physical connection between the two routes at a southern point, should the actual origin or distribution of divertable truck traffic be Chattanooga (unlikely). It is more likely that the freight may be bound through Chattanooga or Knoxville, having originated at or being destined for, a point south or west of Chattanooga, making this routing perhaps even more convenient.

Phase I Results

The proposed improvements will double the capacity of a segment which presently carries fourteen trains per day. Assuming an average train size of 100-120 freight cars, and one trailer per car, diversion capacity is 500,000 – 600,000 trailers per year. Our financial analysis is based upon diverting 500,000 trailers per year. This estimate, in turn, is based upon diversion projections furnished by NS as a reasonable estimate of the market for such a first-phase effort. No final agreement has been reached with NS at this time, however in the Fall of 2002, NS informally indicated that a surcharge of slightly more than \$20 per freight car was acceptable as a means of financing these improvements. That tentative agreement has not been further refined. This estimate serves as the basis of the Fluor proposal, contingent upon confirmation of efficiency indicated by the ongoing analysis of Reebie (see below), and the agreement of NS. Additional analysis has taken place since that time; however, the results have not been published nor made available to Fluor. The improvements proposed are necessary to serve any amount of freight diversion by NS which takes place in the I-81 corridor. As such, this Phase I proposal remains a viable and necessary first step. Fluor further believes that these improvements will be compatible with the Expressway technology that Reebie may recommend (see below).

Fluor Phase II Improvements

All of the freight rail improvements proposed by Fluor are designed to enhance the capacity and speed of NS freight service. This enhancement will be compatible with the freight carriage provided by I-81, i.e., freight service which includes, or is convenient to and competitive with, the Harrisburg, Pennsylvania – Knoxville/Chattanooga, Tennessee corridor. The Phase I improvements will blend quickly into a program of subsequent improvement projects (Phase II). This blending process will incrementally improve the ability of NS to handle diverted freight, and will also enable NS to capture this freight through improvements in the cost and time of shipping as measured against competing trucks. The underlying analysis for the Fluor proposal is derived from several sources including discussions with Virginia Department of Rail and Public Transportation (VDRPT) officials and NS. This analysis also includes reliance upon the work performed under Senate Joint Resolution 55, which continues today through the work being undertaken by Reebie Associates, Wilbur Smith, Woodside Consulting, and Atherton, Mease and Company, for VDRPT (the so-called “Reebie Report”).

The Reebie Report is, at this date, incomplete, unpublished, and unavailable to the Fluor team. Accordingly, some of the specifics, including rail facilities to be upgraded, new rail facilities, costs, and projected diversions of freight, are not yet available for Fluor to provide. Given the stature of Reebie and the significant volume of prior work performed by Reebie, VDRPT and NS in this area, it is not prudent for Fluor to undertake a separate study. Nevertheless, we

understand from publicly available information including a March 31, 2003 draft Reebie report which we have obtained, other Reebie materials used in a September, 2003 presentation to AASHTO, and discussions with interested parties including NS and VDRPT, that Reebie may recommend a series of rail improvements, including track and siding facilities, signalization improvements, loading and unloading facilities, as well as new rolling stock. These and other improvements proposed will dramatically enhance the ability of the freight rail system to divert most freight loads from the I-81 corridor.

Bearing in mind that these improvements may be modified through public discussion and debate, and could be subject to the concurrence of NS and the availability of necessary public funding, if required, Fluor proposes to construct and finance based on these set of improvements. Our approach is free market-driven and will preserve freedom of choice and increase competition in the corridor. In addition, it will be a scalable program of freight rail improvements and additions with each new or upgraded facility being capable of handling increased freight traffic (quantifiable, at a measurable cost). As supply is created and utilized by increased demand, additional incremental improvements will be developed, designed, financed, constructed, and placed into operation, thereby resulting in the diversion of more freight. These improvements will begin in Virginia but will rapidly spread to other states as the program expands. It should be remembered that, improving speeds and throughput in Virginia helps only if bottlenecks are also eliminated in other places along the NS network. Eventually, this program will encompass much of the NS network and, potentially, the networks of connecting carriers. Each expansion can, and will, be evaluated in terms of its costs and benefits. The Fluor team will bring together all of the necessary parties – NS, VDRPT, the FRA, as well as interested members of the public, the passenger rail constituency, and affected local governments, to refine the diversion proposal into one which can be implemented smoothly into a seamless set of rail improvements. It is believed that these improvements will divert the maximum possible amount of highway freight to rail.

Phase II Results

Currently, we believe that at least one-third of through highway freight can be diverted. Our goal is to accomplish at least that amount. Results of our research are discussed further in Section A.2, below. Again, the Fluor team is committed to financing and implementing an aggressive diversion program, which will make substantial difference to I-81 truck traffic. Achievement of this objective will be remunerative to the rail operator and will provide significant environmental and transportation benefits to the public.

Funding

Other than the Railroad Rehabilitation and Innovation Finance (RRIF) program, a loan program administered by FRA, which is limited in amount, no public program exists for the funding of freight rail improvements for this purpose. Thus, Fluor proposes to undertake this program by accessing private capital markets, in addition to RRIF, in order to finance the series of rail improvements necessary to meet diversion goals. The cost of capital is expected to be funded by freight surcharges imposed on NS traffic over the financed facilities. The program will be

structured in the most favorable way possible for NS, to maximize benefits and minimize risk and cost. Overall, we expect that each upgrade and investment will capture additional freight for the NS rail system. This approach will remove freight from I-81 and avoid costs of about 25 cents per mile, per truck (\$0.05 in hard costs for pavement otherwise borne by the owner of the road, and \$0.20 for environmental, safety, and congestion costs otherwise borne by the public). Such an approach will amount to a total highway cost savings of more than \$80 for each end-to-end truckload diverted. This analysis provides a reasonable basis upon which to seek public contributions toward the cost of the improvements, whether in cash, grants or loans, or in the form of additional security for private capital. Fluor will seek to supplement private capital with such public contributions.

A.2 Rail Issues

Describe the impacts of your proposed rail improvements on I- 81 truck traffic and Norfolk Southern Freight movements, referencing these impacts to existing I- 81 truck traffic and Norfolk Southern volumes as percentages.

The improvements recommended by Fluor in Phase I that would take place between Manassas and the West Virginia state line address a significant “choke point” for freight moving in the Southwest – Northeast corridor along the Norfolk Southern (NS) System. This section of the NS network presently operates at full capacity, handling four local and ten through trains per day. Without the Fluor Phase I proposal, no diversion will be possible. The physical upgrades proposed for this section, plus the signalization, will nearly double this capacity, thereby allowing for an additional throughput of approximately 500,000 - 600,000 freight cars per year. Fluor has conservatively based its diversion estimates at the lower end of this range. This first phase is presently constructed as a facility upgrade only, without the implementation of Expressway-like technology (which would require acquisition of new, special-purpose, rolling stock by NS). As such, it represents a first step toward increasing diversion, by giving NS the capacity enhancements needed to alleviate a “choke point”, which currently prevents diversion onto its network. As further developments and analysis take place, including Reebie’s analysis, this expansion could be supplemented by terminal and rolling stock investments. These investments would accelerate the overall diversion program. Accordingly, we can state with confidence that we expect the upgrades between Manassas and the West Virginia state line to double the freight movements along that section of NS track.

This diversion would remove the corresponding number of trucks (500,000-600,000) from virtually the entire length of I-81 in Virginia. We do not believe that short-haul, intermodal freight diversion is economical and, therefore, only through trucks are likely to be diverted. The number of through trucks on I-81 is subject to debate. For example, STAR claims that 77 percent of trucks on I-81 are through trucks, yet the March 31, 2003, draft of the Reebie report uses a figure of 48 percent. Other studies support values between these two limits. The volume of trucks is also subject to interpretation and debate. Reebie claims a 2001 volume of just over 5,000,000 through trucks (March 31, 2003). Other analysis is extremely limited. Therefore, it is difficult to express diversion as a percentage of truck traffic and derive a meaningful result.

For the Phase II program, Fluor believes that it possible to ultimately divert 35 percent or more of through trucks from I-81. This result would be achieved incrementally, as the Phase II program of rail projects and equipment acquisition results in time and cost savings to shippers. These savings can be translated into decisions by shippers to utilize rail. As the volume through trucks increases relative to local trucks, the percentage of total trucks diverted will increase from a range of 17-27 percent to higher levels (depending upon whether the Reebie or STAR estimates of through trucks are correct, or whether the result is somewhere in the middle of this range). If the volume of through trucks/freight loads doubles by 2020 (to approximately 10 million), diversion of 35 percent of these loads would result in 3.5 million diversions per year.

By any measure, this estimate would result in a considerable volume of truck diversions, which will provide considerable public benefits – less pollution and noise, and improved safety.

A.3 Rail Issues

Describe any communications with localities or communities of interest in the vicinity of proposed rail improvements.

Fluor representatives have discussed both the proposed highway improvements, as well as the proposed rail improvements with virtually every jurisdiction along the I-81 corridor, and the support for rail is high. In addition, Fluor has discussed its rail proposal with business communities, civic organizations, and the general public from one end of the corridor to the other end. Again, support for freight rail diversion is quite high.

Fluor also again presented its rail diversion proposals to a group of interested local government, community and business officials in the Front Royal/Warren County area at the Virginia Inland Port in Warren County. This meeting was sponsored by the Transportation Planning Technical Committee, Northern Shenandoah Valley Regional Commission Transportation Committee, Winchester-Fredrick County Chamber of Commerce and the Winchester and Frederick County Metropolitan Planning Organization.

Fluor has also met individually with Clarke County representatives and discussed the impact of the rail proposal on Clarke County and the Towns of Boyce and Berryville. These discussions focused on the specific nature of the improvements and their effects on the community rather than the desirability of the rail traffic. The discussions remain ongoing.

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A.4 Rail Issues

Describe your experience and capabilities to plan, fund, design, and build freight rail improvements.

Introduction

Recognizing the importance of presenting an intermodal solution for reducing congestion along the I-81 corridor, in the Detailed Proposal the Fluor team expanded on the regional rail concept presented in the Conceptual Proposal and highlighted our recent rail experience (please see Detailed Proposal, Section 1.b, pages 1-5 to 1-16). To facilitate your review, the rail experience presented in the Detailed Proposal has been assembled in this section, followed by additional rail project examples. The supplemental examples include freight, high-speed rail, and transit experience illustrating the team's experience in all modes of rail transportation. These representative rail projects clearly demonstrate the team's range and depth of experience in the development, financing, design, and construction of rail projects.

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Railroad Experience

Fluor team members have led some of the largest rail and commuter rail transit programs in the country. A majority of these projects required working around live and active rail operations. Many of these projects have very restrictive environmental issues, fast track design and construction schedules and some of the most extensive Railroad Safety procedures ever performed.

Fluor is currently working with the Federal Transit Administration in providing Program Management oversight for over 11 billion in rail programs. Additionally, Fluor is leading the single largest public private partnership in Europe in the \$1.2 billion Netherlands High Speed Rail Line. Combined, the Fluor team members have completed or are actively involved in over \$18 billion in rail design, engineering and construction. To demonstrate this experience, descriptions of representative rail projects have been provided for your review. Table below provides a summary of this experience.

Representative Rail Projects

Project Name	Location	TIC Value (\$ millions)	Program Manage- ment	Design	Construc- tion	Environ- mental Services
Federal Transit Administration – Program Management Oversight	New York, New York	10,600	X			
Washington Metrorail Extension to Largo Town Center	Maryland	217	X	X	X	
High-Speed Line	Netherlands	1,200	X	X	X	
Northeast Corridor Improvement Project – Programmatic EIS	Washington, D.C. – Boston, Massachusetts	2,200				X
B&O Capacity Improvement	Greenwich, Ohio, to East Gary, Indiana	240		X	X	X
Tri-Rail Double Track Corridor Improvement	Florida	232	X	X	X	
Mustin Field Intermodal Facility	Philadelphia	16		X	X	X
Caltrain Ponderosa	California	50			X	
ReTRAC Depressed Rail	Nevada	171	X	X	X	X
Norfolk Southern/CSX Acquisition of Conrail	Eastern and Midwestern States	12	X	X		X

Project

FTA – Program Management Oversight, New York Region

Federal Transit Administration

New York

\$10.6 billion

Description

Fluor has oversight responsibility for 15 federally funded capital projects in the New York Metropolitan area that when completed represent a constructed value exceeding \$10.6 billion. Projects have included rehabilitation of existing subway lines and railroad bridges, design and construction of new subway lines, yard and shops, station platform and facilities, electrification of existing routes, and rebuilding of transit vehicles.



The Federal Transit Administration (FTA) Region II has awarded Fluor three consecutive contracts to provide program management oversight on designated projects for the New York City Transit Authority, Long Island Rail Road Company, Metro-North Commuter Railroad, New Jersey Transit Corporation, and the Connecticut Department of Transportation.

Program management oversight activities have included monitoring the development, implementation, and effectiveness of timely project management decisions and analyzing the schedule, cost, and workforce requirements. Fluor also supports the FTA with the technical expertise to resolve construction claims, which has resulted in cost-effective settlements rather than lengthy and expensive litigating procedures.

Similarities

- Program Management
- Rehabilitation of railway
- Intermodal connectivity
- Multiple authorities and jurisdictions

Project

Washington Metrorail Ext to Largo Town Center

Washington Metropolitan Area Transit Authority

Prince George's County, Maryland

\$217 million

Description

Lane Construction, as the sponsor of a joint venture is responsible for the design-build construction of the Largo Extension, an extension of the Blue Line Metrorail (Heavy Rail System) near Washington, D.C. The Largo Extension, a 3.1 mile stretch of track, will connect the Blue Line Metrorail from the existing Addison Road Station to Largo Town Center in Prince George's County, Maryland. The project will include a cut and cover tunnel, at grade, and aerial line section including 152,000 cubic yards of concrete temporary support of



excavation, track work; an automatic train control system; traction power; voice and data communications systems; tunnel air circulation and control room; and the construction of various structures to include an operations building; and all associated mechanical, electrical and plumbing.

Similarities

- Design-build
- Heavy rail system
- Cut and cover structures
- Bridges

Project

Netherlands High Speed Line (HSL) – Zuid

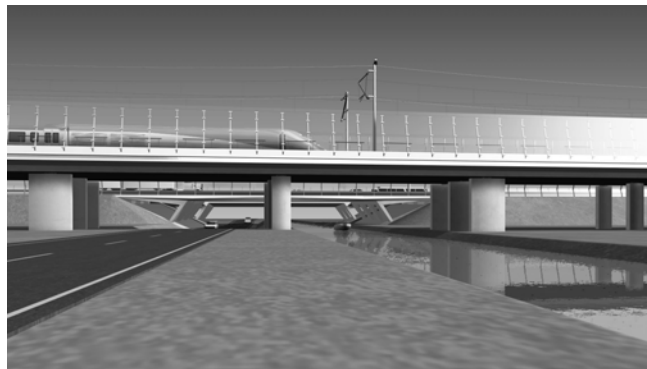
State of Netherlands

Amsterdam to the Belgium Border

\$1.2 billion

Description

Fluor is the lead company in the Infrasppeed consortium selected by the Dutch government to design, build, finance, and maintain the first high-speed rail project in the Netherlands. The \$1.2 billion project represents the single largest public-private partnership (PPP) contract ever awarded by the Dutch State to a private party.



The PPP contract covers a 5-year construction period and a 25-year maintenance period for the superstructure for the HSL Zuid line. The superstructure includes the track system, the power supply system, noise barriers, the European Train Control System (ETCS) signaling system, communication systems and ancillary equipment, such as lighting and control systems.

Fluor is providing program manager services. Infrasppeed member firm Siemens is delivering the power supply system, the state-of-the-art ETCS signaling system, the communication systems, and the ancillary equipment; and Koninklijke BAM NBM will supply the track system and the noise barriers to Infrasppeed.

With top speeds of 185 miles per hour, the new high-speed rail will be a key part of the Trans-European Rail Network. The HSL Zuid line will open on the Rotterdam-Antwerp route by mid-2005. The Amsterdam-Schiphol-Rotterdam route will be completed by the end of 2005. The total route length is 100 kilometers.

Similarities

- Program Management
- Public Private Partnership
- Development of new transit lines
- Successful Finance Program
- Intermodal connectivity

Project

Programmatic EIS, Northeast Corridor Improvement Project

Federal Railroad Administration

Washington, D.C., to Boston, Massachusetts

\$2.2 billion

Description

Parsons furnished program management, design management, and construction management services to develop high-speed rail service along a 456-mile rail corridor between Washington, DC and Boston, Massachusetts.

The Northeast Corridor Improvement Project (NECIP) included preparation of a Programmatic Environmental Impact Statement for the corridor. Working closely with FRA officials, an interdisciplinary team of environmental specialists identified and evaluated potential environmental impacts of the proposed project and outlined appropriate measures for mitigating negative effects. Detailed analyses were conducted for air quality, noise, socioeconomic, land use, energy conservation, historic and archaeological sites, and natural resources. Ridership studies and traffic analyses also were conducted to identify potential effects of alternate transportation modes.

Parsons also managed the task of agency coordination with more than 90 local, state, and federal agencies, as well as interest groups.

Similarities

- Rail and intermodal facilities
- Tiered NEPA process
- 456-mile corridor spanning multiple jurisdictions
- Extensive agency liaison and public outreach programs
- Permit coordination
- Environmental mitigation measures
- Ridership studies and forecasts
- Competing modes of commercial transport



Project

B&O Capacity Improvement Project

CSX Transportation

Greenwich, Ohio, to East Gary, Indiana

\$240 million

Description

Jacobs Civil was selected as the design-build contractor to design and construct nearly 250 miles of railroad track, crossovers, signals, bridges and yard improvements along a vital freight corridor from Greenwich, Ohio, to East Gary, Indiana, in 18 months. The project was completed in all kinds of weather along an operating track that was running 30 to 40 trains a day. The cost for improving capacity to handle up to 80 trains daily was budgeted at \$240 million.



The groundwork for this project was laid in 1996, when CSXT and Norfolk Southern agreed to buy Conrail for \$10 billion. Investing more than \$4 billion for its share, CSXT was to take control of Conrail's assets on September 1, 1998.

In the first four months of the project, value engineering identified estimated savings of \$4.5 million. Jacob's modification of the vertical alignment of new tracks at the Willard Yard facility saved the client \$1 million. Jacob's delivered this enormous design-build effort on schedule and below the guaranteed maximum price. And the quality of work, under the industry's microscope from day one, was first class. Traditionally, new track construction requires surfacing during the first year or so of operation due to compaction under heavy traffic. CSXT management reported that after 2 years, the initial section of track was in excellent line and surface and needed no maintenance.

Jacob's program management involved the coordination and cooperation of the railroad, unions, nearly 40 subcontractors, permitting agencies, and numerous communities throughout the corridor. Hugh Hopkins, CSXT engineer, perhaps stated it best: "I demanded that on this job Jacobs coordinate everything—track, signals, bridges, grading, you name it."

One of the largest private railroad construction projects since World War II has earned Jacobs Civil Inc. the prestigious *2000 National Design-Build Award* by the Design-Build Institute of America.

Similarities

- Design-build project
- Project finance plan development
- Reconstruction of at-grade and grade crossings
- Community relations and outreach effort
- Right-of-way acquisition
- Multi-modal considerations
- Capacity improvements
- Connections to existing facilities
- Project finance plan development
- Grade separation crossings

Project

Tri-Rail Double Track Corridor Improvement – Segment 5

Tri-County Commuter Rail Authority

Palm Beach, Broward, Miami-Dade Counties, Florida

\$232 million

Description

This is a joint venture design-build contract for reconstruction of a commuter rail line in south Florida. The project, awarded by the Tri-County Commuter Rail Authority, traverses Palm Beach, Broward and Dade Counties in Florida. The scope of the project includes upgrading from single lane track to double track on an existing commuter rail line for a total of 44 miles. Work also includes 26 bridges: 12 new, 6 replacements and 8 rehabilitations; 10 stations: 1 new, 9 modifications, and 1 demolition; and 72 road crossings and signals. The design phase of the project began in September 2001, with construction commencing in December 2001.



Similarities

- Design-build
- Community rail
- Bridge structures

Project

Mustin Field Intermodal Facility

Delaware River Port Authority

Philadelphia, Pennsylvania

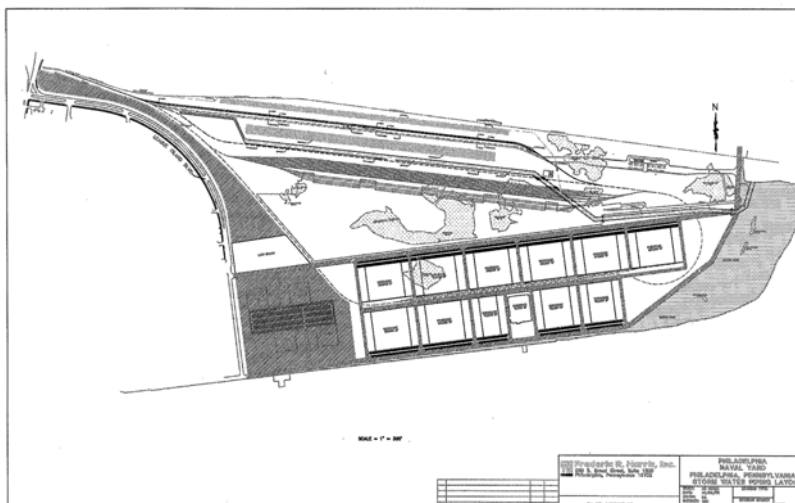
\$16 million

Description

DMJM+HARRIS is under contract to Design/ Build a new freight railroad intermodal terminal at the former Mustin Airfield site in the Philadelphia Naval Business Center (PNBC). The new facility will be constructed and operated by the Port of Philadelphia & Camden and will serve rail traffic from both the Norfolk Southern Railroad and the Canadian Pacific Railroad.

The first phase of the project will involve the construction of approximately 28,000 feet of operating and storage tracks and parking for approximately 950 trailers/containers. The project will include a new gate facility, including Norfolk Southern's standard state-of-the-art security gate system. Facilities will also be provided for crew quarters, offices and maintenance facilities for the lift equipment. High mast lighting, security fencing and other visitor parking and facilities will be provided.

As part of the project, DMJM+HARRIS prepared a master plan for utilities within the East End Commerce Area of the PNBC. The master plan for the entire area includes a Phase II expansion of the intermodal facility, a shared storage yard, a Norfolk Southern planned automotive facility, and approximately 130 acres of warehouse and distribution center space.



Similarities

- Design-build
- Diversion of freight from truck to rail
- Intermodal rail facility
- Economic development
- Performed in conjunction with Norfolk Southern

Project

Caltrain Ponderosa

Peninsula Corridor Joint Powers Board

San Francisco to San Jose, California

\$50 million

Description

This project is an overhaul of the 47-mile-long main rail line between San Francisco and San Jose, California. Caltrain operates 68 trains along the line each weekday, serving downtown centers through nearly every city on the San Francisco peninsula and two major airports.



Items of work include 10 miles of double-track reconstruction; reconstructing four train stations, platforms and shelters; a \$7 million train signalization package; renovation of surrounding parking lots; realigning track with new transit centers and train stations, as well as flattening out curves; and drainage.



Crews work around the clock removing and replacing track from Friday night to Monday morning when the trains are shut down. Any delays to the line reopening on schedule result in \$15,000 liquidated damages per train. Other challenges include crew logistics; coordination with utility companies and cable operators; confined access in downtown centers; and securing permits.

Similarities

- Fast track
- Signalization
- Coordination with utility companies

Project

ReTRAC Depressed Rail

City of Reno

Reno, Nevada

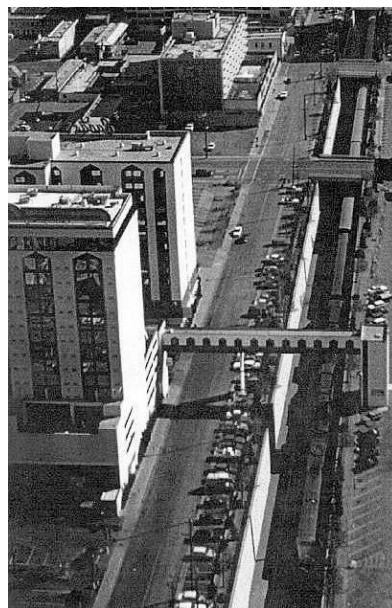
\$171 million

Description

The ReTRAC project calls for the depressed alignment, or the lowering below existing grade, of a 2.1-mile section of the Union Pacific Railroad line currently running through the downtown Reno area. Additionally, it provides for the construction of eleven new street over-crossings, the relocation of utilities, upgraded landscaping and all associated curbs, gutters, street paving, signing, lighting and aesthetics. The project will eliminate at-grade traffic crossings through the downtown area, which will minimize delays for emergency response units and afford safe pedestrian and vehicle over-crossings.

Similarities

- Design-build
- Railroad
- Shoofly construction
- Urban setting
- Utility relocations



Project

Norfolk Southern/CSX Acquisition of Conrail—Preparation of EIS

Surface Transportation Board

Eastern and Midwestern States Adjacent to Rail Lines Owned by NS/CSX/CR

\$12 million

Description

Parsons successfully completed the largest Environmental Impact Statement (EIS) ever undertaken, analyzing the effects of CSX and Norfolk Southern railroad companies' merger with Conrail. The \$10.8 billion acquisition of Conrail covered a project area that encompassed 44,000 track miles in 24 states. PTG was responsible for the environmental analysis of operational improvements, development of numerous mitigation strategies, coordination with local, state, and federal agencies, and coordination with the three railroads. Parsons also developed negotiated mitigation measures for affected areas.



The project included extensive field verification and solicitation of comments from the public. Specific environmental mitigation was developed for several localities. Parsons supervised an extensive public outreach program and the management of comments from the states, cities, and other entities affected by the acquisition.

The fast-track project was completed in 18 months. A draft environmental impact statement (DEIS) was released in December 1997; comments were received in February 1998; and a final EIS was submitted in May 1998.

Similarities

- A major complex program
- Fast-track project with numerous challenges
- Extensive public outreach and agency coordination
- Innovative and defensible environmental strategy
- Complex project management with major staff resources needed

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Supplemental Examples

Rail Experience

Project Name	Location	TIC Value (\$ millions)	Program Management	Design	Construction	Environmental Services
Alameda Corridor	San Pedro to East Los Angeles, California	2,000	X	X	X	X
Hamersley Iron Rail Network	Western Australia	Confidential		X	X	
East Hills and Waterfall-Bomaderry Rail Maintenance	New South Wales, Australia	Confidential		X	X	
Los Angeles County Metropolitan Transportation Authority	Los Angeles County, California	10,000	X			
East Coast Main Line Upgrades	Great Britain	2,300	X			
I-25 Southeast Corridor Transportation Expansion	Denver, Colorado	1,200	X	X	X	
Old Colony Railroad Rehabilitation	Boston, Massachusetts	120		X	X	X
Hiawatha Light Rail Transit	Minneapolis/St. Paul	291	X	X	X	
Salt Lake City – North/South Light Rail	Salt Lake City, Utah	50		X	X	X
ACELA High Speed Rail	New Haven, Connecticut, to Boston, Massachusetts	500		X	X	

Project

Alameda Corridor

Alameda Corridor Transportation Authority

San Pedro to East Los Angeles, California

\$2 billion

Description

The 20-mile-long Alameda Corridor was a design-build project to provide a fully grade-separated rail link between the ports of San Pedro Bay (Los Angeles and Long Beach) and the rail yards and transcontinental rail network east of downtown Los Angeles. Divided into three segments, North End work involved links to existing intermodal rail yards; South End work involved construction of rail links to the ports; and Mid Corridor work involved design and construction of a reinforced concrete trench 10 miles long, 30 feet deep, and 50 feet wide. The trench contains 2 main-line freight railroad tracks and a service roadway. In all, the Alameda Corridor stretches across seven cities and unincorporated Los Angeles County. Included are four major grade separations, 37 bridges, 500,000 feet of new track, full train signalization with centralized train control, 200 utility relocations, and 250 property acquisitions. Coordination with at least seven municipalities was conducted along the route for design approvals, municipal enhancements, and traffic control plans.



PTG was an equity partner on the Mid Corridor Trench joint venture team that was responsible for all design; design approvals, including the railroads, municipalities, and utilities; construction; and commissioning. PTG also provided environmental review services for the Alameda Corridor-East Program that was developed to mitigate impacts of increased freight rail traffic on two rail lines in the San Gabriel Valley of Los Angeles County. PTG and its subconsultants, including DMJM+HARRIS, provided analysis and environmental documentation for the projects to comply with the NEPA and CEQA environmental review process.

As Alameda Corridor Transportation Authority (ACTA) program manager, DMJM+HARRIS provided support in general management and administration, project funding, preliminary and final engineering, right-of-way engineering, design management, environmental management, project controls and information systems, and construction oversight and support. DMJM+HARRIS further helped ACTA in developing, advertising, evaluating, and awarding its construction contracts.

Similarities

- Design-build-finance
- Multi-modal improvements
- Multi-jurisdictional
- Environmental services
- Roadway, railroad, and structures

Project

Hamersley Iron Rail Network

Hamersley Iron Pty. Ltd.

Western Australia

Value confidential

Description

Since 1968, Fluor has designed, constructed, maintained, upgraded, repaired and extended Hamersley Iron's heavy haul railway in the remote Pilbara region of Western Australia. The rail lines are essential to the success of both the company and the region. 360,000-ton trains 3 km long—the heaviest in the world—haul 120 million tons per year from several mines to two port facilities.



The lines maintained cover 700 route kilometers of track from mines at Tom Price, Paraburdoo, Channar, Brockman, Yandicoogina and Marandoo to the port of Dampier. During our time there, Fluor has converted the entire track to concrete sleepers and have designed and built approximately 400 kilometers of new track. Track conversion consisted of:

- Replacement of all original mainline 54kg rail with 68kg rail
- Replacement of all timber sleepers with concrete sleepers
- Replacement of all timber ties under mainline turnouts with concrete ties
- Replacement of mainline crossings with swing nosed crossings
- Introduction of tangential geometry turnouts

Maintenance includes all permanent way, double track, passing loops, and sidings yards. Also included is construction and maintenance of bridges (both prestressed concrete and welded steel girder), numerous tunnels and all formation, culverts, access roads, protective leases, and level crossings. All track is maintained to specifically defined high standards suitable for trains with 30 ton axle loads travelling at 65km per hour. Of significance is the fact that Fluor has maintained a continuous weld of rail in temperature ranges between 10°C to 80°C.

Similarities

- Maintained over 700 km of heavy rail carrying the world's longest and heaviest trains in daily service
- Designed and built over 400 km of new track
- Implemented numerous projects to add new capacity
- Designed and constructed support infrastructure required for rail operations
- Concurrent execution while maintaining passenger rail lines

Project

East Hills and Waterfall-Bomaderry Rail Maintenance

Rail Access Corporation

Sydney and Wollongong, New South Wales, Australia

Value confidential

Description

Fluor provides total rail asset management for two Rail Access Corporation projects in New South Wales, namely the East Hills line and the Waterfall-Bomaderry line. Rail Access Corporation is a state government owned enterprise responsible for managing rail assets in New South Wales.

The scope of work includes regular maintenance, major periodic maintenance and implementation of capital improvement program for 268km of suburban track on the East Hills line, and country and interurban track for Waterfall-Bomaderry. The services performed encompass various disciplines that include civil, electrical and signal maintenance, design and construction activities.



Both projects are managed as alliance contracts with performance based fees. Performance indicators on both projects are the safety of both the system and personnel, project cost against budget, track service reliability, track availability, audit compliance and schedule. The project includes 24 hour, 7 day a week emergency call out to attend to derailments, broken rails, buckled track and other incidents. Fluor provided extensive resources to Rail Access Corporation when major rains and associated flooding caused extensive damage to the Waterfall-Bomaderry line.

A major capital improvements project associated with the East Hills line was the line quadruplicating project, which consisted of constructing a new rail junction incorporating 12km of new track, turnouts, overhead wiring and signaling to significantly enhance rail operations. The scope of work included extension, renewal and rehabilitation at overpasses, underpasses, and culverts and associated earthworks and noise attenuation barriers. For the Waterfall-Bomaderry project, the capital improvement programs included the installation of 24km of new 1500v DC overhead traction wire and catenary, five traction stations and 20km of new 33kV transmission lines. Civil works included platform extension, clearance improvements to two tunnels, new stabling facilities and a new signaling and communication system.

Similarities

- Performed maintenance for 268km of suburban track to improve operational efficiency
- Performed capital improvement programs to optimize and enhance rail operating capacity
- Designed and constructed support infrastructure required for rail operations
- Managed cost and schedule of capital improvements program and maintenance services for efficient utilization of assets.

Project

East Coast Main Line Upgrades

Railtrack

Great Britain

\$2.3 billion

Description

Fluor led a team having program management responsibility for a \$2.3 billion program of rail infrastructure upgrades and improvements to Railtrack's East Coast Main Line (ECML). This partnership would have seen the execution of the upgrade program for the King's Cross to Edinburgh route over 10 years.

The integrated project team included Railtrack personnel working alongside Fluor and its joint venture partner, Mott MacDonald, in a group dedicated to achieving Railtrack's objectives. The program scope required close liaison with Railtrack in the overview management of technical, commercial, and legal aspects of the upgrade that involved the execution of more than 50 projects ranging from \$1.5 million to \$250 million in total installed cost.

The ECML Upgrade Program's primary objective was to achieve increased capacity for both freight and passenger trains. It included design for bridge strengthening to carry both heavier and faster freight trains on upgraded tracks. The program included track, signaling, stations, and associated facilities projects. Projects ranged from improvements to the permanent way, construction of new track to create freight routes running parallel to the existing route, re-signaling, remodeling and extension of stations, and building of flyovers to relieve the congestion created by the present flat crossovers.

Work on the projects had to be completed with no disruption of the scheduled train operations and, as a consequence, represented a considerable logistical and safety challenge.

Similarities

- Program Management
- Remodeled facilities to relieve congestion
- Constructed new track for freight routes
- Upgraded 650 km-long rail corridor
- Increased capacity for freight and passenger trains



Project

LACMTA Program Management Oversight and Assistance

Los Angeles County Metropolitan Transportation Authority

Los Angeles County, California

\$10 billion

Description

The Los Angeles County Metropolitan Transportation Authority (LACMTA) contracted with Fluor to provide project management oversight services on \$1.9 billion worth of locally funded rail projects and project management assistance on \$8 billion of locally and federally funded projects. Reporting directly to the construction executive officer and the Board of Directors, Construction Subcommittee, Fluor was charged with setting the standard for excellent performance.

The project management oversight responsibility included reviews of Authority documents, contracts, policies, procedures, and practices and reviewing and monitoring engineering management and construction management activities. The project management assistance responsibilities encompassed a variety of tasks such as management reviews, cost management reviews, constructability and claims avoidance reviews, design quality reviews, total quality management training, safety audits and safety education, quality assurance/quality control audits, technical engineering assistance, and other special studies.

LACMTA is responsible for the design and construction of one of the largest new-start transit rail programs in the United States. The region's plan covers a nearly 150-mile-long rail transit system and a 150-mile-long commuter rail system.



Similarities

- Program Management
- Development of new transit lines
- 150-mile corridor spanning multiple jurisdictions
- Urban setting
- Intermodal connectivity

Project

I-25 Southeast Corridor Transportation Expansion (T-REX)

Colorado Department of Transportation/Regional Transportation District

Denver, Colorado

\$1.2 billion

Description

The Transportation Expansion (T-REX) Project officially began May 2001. Southeast Corridor Constructors, a Kiewit-led joint venture, was awarded the \$1.2 billion design-build project. With an expected completion date in September 2006, project personnel are on the fast track to reconstruct 17 miles of two interstate highways, while simultaneously adding 19 miles of new double-track light rail transit (LRT) line, including 13 new stations. In addition, the multi-modal project includes the construction or reconstruction of 61 bridges, 14 LRT bridges, 3 LRT tunnels, 400 utility relocations, 200 new power feeds, \$40 million of drainage improvements, and improved pedestrian access.

Kiewit will install the traction electrification, signaling and communications systems along the new corridor and be responsible for a new Operations Control Center, signal modifications, and communications system on 3 existing lines.

Unique aspects of the project include a combination of highway and mass transit construction; public involvement and information programs; a plan to minimize environmental impacts; and Intelligent Transportation Systems to monitor traffic and freeway incidents, manage traffic flow, provide ramp metering, and enhance security at light rail parking facilities.

When complete, the T-REX project will increase transit options, enhance safety, replace aging infrastructure, reduce travel time and congestion on nearby arterial streets, and support growing residential and commercial areas served by the Southeast Corridor.

Similarities

- Design-build
- New transit corridor
- Multi-modal facilities
- Transit Construction
- Public involvement and information programs



Project

Old Colony Railroad Rehabilitation Project

Massachusetts Bay Transportation Authority

Boston, Massachusetts

\$120 million

Description

The Old Colony Rail Road consists of 80 miles of track way, which formerly served passengers in communities south of Boston. A mainline runs 35 miles south with 2 major branch lines one 27 miles to Plymouth and one of 18 miles to Scituate. Service ceased on the lines in 1959 but the owner, Massachusetts Bay Transit Authority, has restored service in response to growing demand. Jacob's responsibilities were to carry out the rehabilitation of this abandoned facility to create an active commuter railway system. Activities in the development of this system include: (1) a public participation program; (2) an environmental assessment and review process; (3) operations planning for the railway facilities and stations; and (4) preliminary design, final design and constructions services for the physical elements. This included a major bridge crossing at the Neponset River, replacement or rehabilitation of several minor bridges, an underpass beneath a rapid transit rail line, retaining walls, culverts, and other roadbed improvements, numerous grade crossings, new track and signal systems, and passenger facilities and parking at approximately 20 new or restored station sites.



Because development has proceeded unabated in the immediate vicinity of abandoned track way and station sites, the restoration of the system required extremely efficient use of the available space and responsiveness to bordering land uses.

In September 1997, the MBTA opened the two restored commuter rail lines providing service between South Station in Boston and communities to the south, Middleboro and Plymouth Lines. Since the two lines reopened in 1997, ridership has grown substantially.

Similarities

- Project finance plan development
- Capacity improvements
- Multi-modal considerations
- Reconstruction of at-grade and grade crossings
- Right-of-way acquisition
- Connections to existing facilities
- Community relations and outreach effort

Project

Hiawatha Light Rail Transit

Minnesota Department of Transportation/Metropolitan Council

Minneapolis/St. Paul

\$291 million

Description

This is a joint venture design-build project led by Granite Construction Company and including C.S. McCrossan, Inc., Parsons Transportation Group and Edwards and Kelcey. The project involves the design and construction of an 11.6-mile light rail transit system serving the Minneapolis Twin Cities area. The line extends through the Hiawatha Avenue corridor from downtown Minneapolis, through the Minneapolis/St. Paul Airport to the Mall of America in Bloomington.

The project is being constructed in a series of six segments with the final segment scheduled to be completed in 2004. Work involves relocating and constructing numerous utilities, and coordination with 30 utility agencies. Scope of work includes 15 stations, a light rail vehicle maintenance facility, rehabilitation of existing bridges, construction of new bridges, retaining walls, roadwork, trackwork, traction power system, Supervisory Control and Data Acquisition system (SCADA), traffic control system, communication system, and landscaping.



Similarities

- Rail transit (12 miles)
- Track work design and construction
- All systems design and construction
- Systems integration and testing
- Utility relocation, earthwork and ballast design and construction
- Drainage, structures and site work design and construction
- Stations design and construction

Project

Salt Lake City – North/South Light Rail

Utah Transit Authority

Salt Lake City, Utah

\$50 million

Description

Granite performed reconstruction of an existing freight line to accommodate both freight and light rail service. All work on this 13-mile rail corridor was done while maintaining existing freight operations and follow-up light rail vehicle testing. For the fixed facilities, work included utility relocation, grading, drainage, structures, sub-ballast and grade separations (overhead). Also included were 11 stations which involved site work, furnishings, lighting, tactile tile, handicap ramps, landscaping and irrigation. There was also a vehicle maintenance facility with site grading, storage tracks and paved parking.

Three miles of freight sidings were constructed. System-wide elements included new bridges and reconstruction of existing bridges and box culverts, seismic retrofitting of existing structures, and relocation and expansion of drainage systems. Finally, communication and OCS duct systems were furnished and installed, site work was done for a traction power substation; a grade crossing warning system was procured and installed; and grade crossings were reconstructed. Due to previous operations along the corridor, most of the project area was contaminated with heavy metals. This required the control of access and environmental protection throughout the job. A portion of the project was completed under the guidelines of EPA- and DEQ-controlled cleanup programs.



Similarities

- Maintaining existing rail operations
- Rail transit (3 miles)
- Partial systems construction
- Utility relocation, earthwork and sub-ballast construction
- Drainage, structures and site work construction
- Stations construction

Project

ACELA High Speed Rail

Amtrak

New Haven, Connecticut, to Boston, Massachusetts

\$500 million

Description

As part of a joint venture, Mass Electric Construction Co. (MEC), a Kiewit subsidiary, completed design verification and construction of Amtrak's 157-mile electrified high-speed rail segment between New Haven, Connecticut and Boston. The \$500 million project involved the installation of over 14,000 foundations and catenary poles; 300 miles of static, feeder, messenger and contact wire; power supply, including four feeding substations, three switching stations and 18 paralleling stations; interlock lighting; backup signal power; and bridge carriers. "Live" tracks carried trains passing within four feet of the work areas at speeds up to 90 mph.



The overhead contact system (OCS) is a constant-tension cantenary system designed for use with trains operating at speeds up to 150 mph. The rail line runs under 224 bridges and through several tunnels, the longest being the 4,000-ft. Back Bay Tunnel in Boston.

The testing and commissioning phase placed all electrical equipment into operational service, including over 300 track miles of OCS equipment, 25 power supply sites, movable bridges and substation harmonic filters. MEC accelerated the schedule by using 373 additional workers and 50 supervisory personnel working 24 hours per day.

Similarities

- 157-mile rail corridor
- Rail improvements
- Multiple jurisdictions

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B.1 Environmental Issues

Describe in aggregate, the environmental benefits of your proposal.

The principal environmental benefit of our approach is the minimization of right-of-way and displacement impacts of all kinds. By containing most of the improvements within existing right-of-way, the displacements of homes, businesses, farmland, historic properties, and other human and natural resources would be avoided or minimized, which is a fundamental tenet of environmental protection laws and regulations.

To the extent that the project would relieve congestion, air quality benefits would accrue from reductions in carbon monoxide emissions. In addition to reducing these “mobile” emissions along the travel corridor, the implementation of IdleAir systems at travel centers and truck stops will also have a beneficial effect of reducing “localized” hot-spot emissions. Each of the 1,000 proposed units is estimated to reduce NOx emissions by idling trucks by 761 pounds per year – appreciably reducing the pollution currently spreading to surrounding communities.

Water quality benefits would accrue from installation of stormwater management measures that are required now for all new construction. During the earlier days of Interstate highway construction, less stringent stormwater runoff controls were required. The new stormwater management measures will reduce long-term contamination of surface waters by pollutants generated by highway traffic.

Since the original construction of I-81, a number of new developments have been built alongside the highway, and they are subject to noise impacts from traffic on the highway. An analysis of noise impacts from the project likely will identify a number of locations where noise barrier walls are warranted. Such walls would reduce noise levels that otherwise would remain unmitigated in the absence of the project.

Environmental impact studies and documentation will result in a number of environmental benefits in terms of resource identification within the corridor, education of citizens along the corridor regarding such resources through the public involvement process, and involvement of local governments interested in resource planning and preservation. Among the resources would be historic properties, endangered species, and farmland.

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B.2 Environmental Issues

Describe the process or specific design elements in your proposal intended to preserve the overall aesthetics and/or specific viewsheds in the corridor.

A major design principle guiding our project development is to minimize the impact to the environment by widening to the inside and by minimizing the footprint used at the interchanges. The inside widening allows for 54 percent of the corridor to maintain a grassed median without a center barrier, and another 19 percent of the corridor requiring a barrier, but may still have some green space. As for the footprint at the interchanges, having fewer lanes being required for the alternative helps to minimize the footprint. Walls will also be considered at interchanges in order to minimize the right-of-way required. Not only does the proposed design minimize physical impacts to the surrounding environment, it also minimizes the amount of visual intrusions introduced to the valley viewshed.

Project design elements were incorporated with two different viewsheds in mind: the view from the adjoining properties as well as the view for the highway user. Often this second element is not considered but is a very important aesthetic consideration.

View of the Highway—For landowners along the road, the containment of most of the construction within the existing right-of-way footprint would minimize the disruption or destruction of visual attractions adjacent to the highway. From most viewpoints the facility will appear nearly identical to its current order, particularly in the many areas where the existing buffers are maintained. The introduction of new visual elements will be limited to the overhead structures associated the electronic toll collection and traffic management system. By design these systems are very similar to the existing overhead sign structures and visually are very compatible with the other components of the conventional interstate facility.

View from the Highway—A traveler's enjoyment of aesthetics and viewsheds along a highway relies in part on the comfort, safety, and stress levels experienced when driving the highway. Congested conditions and perceptions of unsafe conditions cause distractions and diminish the traveler's sensory response and the ability to appreciate and enjoy attractive views. To the extent that the project would reduce stress levels and improve safety, the ability to enjoy views along the road also would be enhanced. The concept of widening to the inside would minimize the need to destroy or disturb attractive landscapes beyond the road edge. The reconstruction of the roadway would afford opportunities to enhance visual and functional coherency in the lines and forms of the roadway environment, thereby improving the visual enjoyment by the traveler.

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C.1 Traffic Issues

Provide details of any vehicle diversion studies you have performed, including likely diversion rates and routes.

Fluor retained Vollmer Associates LLP (“Vollmer”) to prepare preliminary traffic and revenue estimates to serve as the basis for our Plan of Finance for the proposed I-81 improvements. Vollmer is a multidisciplinary firm with extensive experience in toll facility planning and operation. Over the past 25 years, it has been involved in traffic and revenue studies that have supported approximately US\$17 billion in financing for toll facility projects in the United States, Canada, Mexico, and Central and South America.

The work effort for the Vollmer study included assimilating available data related to traffic volumes throughout the corridor (on the existing I-81 highway and parallel SR11) and conducting field surveys (including some travel time and distance runs on the roadway network). For this preliminary analysis, however, no project-specific origin and destination or vehicle diversion studies were performed. Because of the significant amount of time and effort required to complete such studies, that work is normally undertaken as part of the EIS process.

To determine likely vehicle diversion rates for the I-81 Project, Vollmer used standard traffic forecasting methodologies that reflect the value drivers will attribute to the time required for trips via the improved I-81 versus the competitive routings (SR11 for local trips and other major Interstate corridors for the long-distance trips). Factors considered in the analysis are the assumed trip purpose and frequency, general travel convenience and comfort, trip length, reliability in terms of predictability of travel time, availability of alternative travel routings, and the acceptability or resistance to the concept of paying tolls.

After submission of the Detailed Proposal in September, Vollmer refined the traffic model to explicitly reflect the incentives Fluor has proposed for local and frequent travelers, specifically free travel for transponder customers making trips of less than 10 miles and discounted travel for trips 10-30 miles as well as frequent users. While the analysis remains preliminary and will need to be confirmed in the investment grade traffic and revenue study, the results indicate that the proposed incentives can be offered without impacting the Fluor Finance Plan. The resulting traffic retention assumptions can be summarized as follows:

Table C1: Traffic Retention Assumptions

Potential Local Trips	
Passenger Cars	25% pay applicable toll
	25% eligible for 50% discount (annual pass or other program)
	25% eligible for free travel (trip less than 10 miles)
	25% divert to other roads or do not make the trip
Commercial Vehicles	30% pay applicable toll
	20% eligible for 50% discount (annual pass or other program)
	50% divert to other roads or do not make the trip

Potential Long Distance Trips	
Passenger Cars	66% pay applicable toll
	34% divert to other roads or do not make the trip
Commercial Vehicles	75% pay applicable toll
	25% divert to other roads or do not make the trip

‘Local’ trips are generally defined as trips that would use the Project for part of their trip routing, and would most likely consist of area residents. ‘Long-distance’ trips are generally defined as trips of distances longer than 100 miles, and would most likely consist of travelers into or through the area. Due to the lack of reliable origin and destination data, we are not able to distribute the projected diversion onto any particular alternate route. To minimize traffic diversion, Fluor has proposed free travel and significant discounts for certain local and frequent users. As more detailed traffic analyses are completed during the EIS process, that tolling strategy will be refined to address any concerns about diversion to alternate routes.

C.2 Traffic Issues

Provide overview of I- 81 traffic studies (including present and future car/truck ratios) documenting how the proposal satisfies the Level of Service design criteria of accommodating

Following is an overview of the methodology used to develop the traffic forecasts for the future years up to the year 2035. The methodology included developing base-year traffic (2001) and then forecasting future volumes. Separate growth rates were used for automobiles and trucks. Using these forecasts, the Level of Service (LOS) was generated for each segment along the entire length of I-81. This analysis indicated that approximately 85 percent of the roadway would operate at LOS C or better in 2035.

Year 2001 Traffic

Using the spreadsheet-based, origin-destination traffic model (the ‘traffic model’), we analyzed the traffic count data (the latest full-year data) for the year 2001 to determine the number of trips. The traffic data was received from the Virginia Department of Transportation (VDOT), as presented in their annual summarizes of traffic counts made throughout each calendar year, entitled “Average Daily Traffic Volumes, on Interstate, Arterial, and Primary Routes, 2001.” We also received traffic data from other reports prepared by VDOT and from other project team members. All of the data received generally were in agreement and the relative differences in traffic count data from the various sources were, for this analysis, negligible.

Near the northern boundary of the Project, the actual average daily traffic in year 2001 ranged from 35,000 vehicles/day near the West Virginia border to 55,000 vehicles/day near Winchester, Virginia. Near the middle portion of the Project, the actual average daily traffic in year 2001 ranged from 35,000 vehicles/day near Interchange 162 to 65,000 vehicles/day near Roanoke. Near the southern boundary of the Project, the actual average daily traffic in year 2001 ranged from 25,000 vehicles/day near Interchange 50 to 50,000 vehicles/day near Interchange 17.

Passenger-car volumes ranged from 57 percent of the total traffic (near Interchange 205) to 77 percent near the northern border with West Virginia.

Estimated Future Growth

Traffic on highways is often related to changes in: population; industrial production (Gross Domestic Product [GDP] or Industrial Production Index [IPI]); or other socioeconomic factors (such as unemployment, gasoline prices, etc.). Reviews of historical trends and forecasts of future activity levels are useful when preparing future traffic estimates. However, past socioeconomic trends must be related to past traffic trends in order to correlate a relationship between the two factors (of the past) to help project a future trend. For this preliminary feasibility study, we conducted only preliminary analyses in order to make this type of

correlation. Therefore, we have made several assumptions as to estimated future growth, based on our extensive experience in the area of traffic analyses.

Fluor has gained extensive experience in this area in both the United States and Canada. The work performed in these countries is based on a stable economy, which includes factors such as: low inflation, low unemployment, consistent economic and commercial growth, and reliable gasoline prices. This experience also factors in a corridor that serves “through” traffic proceeding either to or from major metropolitan centers. Based on this experience, we have determined that long-term growth rates are usually between 2 percent and 4 percent per year. Generally speaking, a facility’s annual traffic growth rate declines the longer the facility is in operation.

The recent traffic trends on established roadway networks experienced throughout the United States, and, specifically, in the northeastern United States, show growth patterns in the range of 2 to 4 percent for passenger vehicles and 0 to 3 percent for commercial vehicles. For the near term (next five years), we have assumed a passenger vehicle growth rate of 3.5 percent per year, decreasing to 3.0 percent per year for the following five years. For the longer term, the annual growth rates of the near term were decreased to levels between 1.5 and 2.5 percent per year, indicating that, over time, a stable, yet moderate, growth would most likely occur.

Vollmer assumed a steady commercial vehicle growth, for the near term (the next five years), of 3.5 percent per year, slowing down to 3.0 percent per year for the following five years. For the longer term, the annual growth rates of the near term were decreased to levels of between 2.0 and 2.5 percent per year, indicating that over time a stable, yet moderate, growth would most likely occur.

Level of Service

The resulting volumes for average daily traffic were used to generate peak-hour volumes to develop Levels of Service (LOS). The capacity, based on the traffic lanes shown in our proposal, was developed for both LOS B and C for both rural and urban areas. The capacity was compared to the peak-hour volumes for the various segments along I-81 to determine the portion of the roadway that met LOS C in 2035. From this analysis, it was found that the roadway would operate at LOS C or better for a period of time between 15-20 years. In 2035, over 85 percent of I-81 would continue to operate at LOS C or better.

For the 40 miles that would not operate at LOS C, several options exist to meet this level of service. These options include adding collector-distributor roads or possibly another lane to the mainline. Fluor would work with VDOT during the NEPA process and the preparation of the EIS to complete a more detailed analysis of the traffic considering the rural and urban segments of I-81. From this analysis and a further refinement of the needs, Fluor would work with VDOT, as needed to determine which option would best address the capacity needs and, at the same time, be the most environmentally sensitive approach.

C.3 Traffic Issues

Provide a summary of any Traffic & Revenue studies

A letter from Vollmer describing their research and analysis for the I-81 Project was included as Appendix 14 of the Detailed Proposal. The following outlines the basic methodology used for calculating potential toll revenue, highlights key inputs and assumptions, and summarizes the resulting traffic and revenue.

General Methodology

Vollmer developed a spreadsheet-based origin-destination traffic model for the I-81 Corridor to predict the potential travel behavior and characteristics of the users of the Project. The general approach can be described as follows:

- Divide the project into 93 segments corresponding to existing interchanges between the West Virginia and Tennessee borders.
- Input 2001 traffic count data for cars and trucks at each segment and apply assumed growth rates to generate the number of potential trips in opening year (assumed to be 2008 for purposes of the analysis)
- Assume tolls are imposed in 2008 and use traffic model to calculate resulting traffic retained at each location, by direction and type of vehicle.
- Multiply estimated tolled traffic for each segment by applicable toll rate and 330 days to generate annual toll revenue.
- Apply assumed traffic growth rates to determine revenue in future years.

Base Year Traffic Data

Vollmer used traffic data from the VDOT annual summarizations of traffic counts made throughout each calendar year, entitled “Average Daily Traffic Volumes, on Interstate, Arterial, and Primary Routes, 2001.” Vollmer also received traffic data from other reports made by the VDOT and from other project team members. All of the data received generally agreed with each other and the relative differences in traffic count data from the various sources were, for this analysis, negligible.

Near the northern end of the Project, the actual average daily traffic in year 2001 ranged from some 35,000 vehicles per day near the West Virginia border to some 55,000 vehicles per day near Winchester. Near the middle of the Project, the actual average daily traffic in year 2001 ranged from some 35,000 vehicles per day near Interchange 162 to some 65,000 vehicles per day near Roanoke. Near the southern end of the Project, the actual average daily traffic in year 2001 ranged from some 25,000 vehicles per day near Interchange 50 to some 50,000 vehicles per day near Interchange 17.

Passenger car volumes ranged from some 57 percent of the total traffic (near Interchange 205) to some 77 percent near the northern border with West Virginia.

Origin and Destination Assumptions

For this preliminary analysis, no project-specific origin and destination studies were performed. No data gathered from outside sources for the analyses of this Project showed any specific information on the origins or destinations of the existing traffic on I-81. Therefore, Vollmer developed the following assumptions to help determine the amount of potential traffic to the toll road:

For passenger vehicles, between 50 percent and 65 percent of the traffic, depending on location, is assumed to make a long-distance trip; the remaining 50 to 35 percent are considered to be local. For example, at locations that include other highways (e.g., the connection of Interstate 64 and the Project), some 65 percent of passenger vehicles are assumed to be long-distance. At locations in or near major towns or cities, some 50 percent were assumed to be long-distance.

For commercial vehicles, Vollmer assumed that the majority, between 75 and 85 percent, depending upon location, make a long-distance trip. For example, at locations that include other highways (e.g., the connection of Interstate 64 and the Project), some 85 percent of commercial vehicles are assumed to be long-distance. At locations in or near major towns or cities, some 75 percent were assumed to be long-distance.

Estimated Future Growth

Vollmer had to make certain assumptions regarding future demographic growth in the corridor based on its extensive experience in the area of traffic analyses and recent traffic trends on established roadway networks in the Northeastern United States. For the near term (the next five years), Vollmer assumed passenger vehicle growth of 3.5 percent per year, slowing down to 3.0 percent per year for the following five years. For the longer term, the annual growth rates of the near term were decreased to levels of between 1.5 and 2.5 percent per year, indicating that over time a stable, yet moderate, growth would most likely occur.

Vollmer assumed a steady commercial vehicle growth, for the near term (the next five years), of 3.5 percent per year, slowing down to 3.0 percent per year for the following five years. For the longer term, the annual growth rates of the near term were decreased to levels of between 2.0 and 2.5 percent per year, indicating that over time a stable, yet moderate, growth would most likely occur.

Assumed Toll Rates

Vollmer analyzed several different tolling scenarios, but the base case used by Fluor to determine financial feasibility assumes an initial toll of 5 cents-per-mile for the passenger cars and 17 cents-per-mile for the trucks. This results in a per-mile toll rate, for a full-length trip, of

\$16.25 for passenger vehicles and US\$55.25 for commercial vehicles. These toll rates, by national and international standards, are on the lower end of the toll rate bandwidth.

Vollmer also assumed a toll rate increase every five years beginning in year 2015. It has been our experience that moderate tariff increases that follow general inflationary rates can be made every few years with little effect negative on traffic, when inflation is at a low to reasonable level (below 5 percent). Tariff increases keeping pace with higher inflationary levels (greater than 5 percent) would affect traffic because of the greater effect that the high inflation levels can have on the economy. Because the starting toll is considered below average, increasing tariff levels would, on a net basis, increase revenues (i.e., the lost traffic is offset by the extra monies collected).

For the passenger cars, the tolls were assumed to increase by US\$0.01 per mile in years 2015, 2020, 2025, 2030, 2035, and 2040. For the commercial vehicles, that increase, applied during the same years, would be approximately US\$0.03 per mile.

Annual Transactions and Gross Toll Revenue

	Passenger Cars		Commercial Vehicles		Total Toll Revenue (2)
	Average Daily Transactions (1)	Gross Toll Revenue \$Millions	Average Daily Transactions (1)	Gross Toll Revenue \$Millions	
2008	23,701	98.4	10,404	186.5	284.95
2009	24,725	103.7	10,845	194.6	298.35
2010	25,779	109.2	11,300	203.0	312.16
2011	26,684	113.9	11,690	210.1	324.01
2012	27,611	118.7	12,090	217.4	336.16
2013	28,562	123.7	12,499	224.9	348.62
2014	29,536	128.8	12,920	232.6	361.38
2015	29,314	154.3	12,879	273.0	427.28
2016	30,338	160.7	13,320	282.5	443.19
2017	31,387	167.3	13,773	292.2	459.49
2018	32,462	174.0	14,236	302.2	476.19
2019	33,565	180.9	14,711	312.4	493.32
2020	33,538	211.9	14,743	360.2	572.19
2021	34,465	218.7	15,242	372.6	591.31
2022	35,410	225.6	15,754	385.3	610.88
2023	36,374	232.6	16,278	398.3	630.90
2024	37,357	239.8	16,816	411.6	651.39
2025	37,264	274.3	16,914	468.2	742.51
2026	38,288	282.8	17,366	480.9	763.69
2027	39,331	291.5	17,827	493.8	785.29
2028	40,395	300.4	18,297	506.9	807.33
2029	41,481	309.4	18,777	520.4	829.80
2030	41,524	349.5	18,821	582.0	931.47
2031	42,653	360.1	19,320	597.5	957.64
2032	43,805	370.9	19,829	613.5	984.34
2033	44,981	381.9	20,348	629.7	1,011.57
2034	46,179	393.1	20,878	646.2	1,039.34

	Passenger Cars		Commercial Vehicles		Total Toll Revenue (2)
	Average Daily Transactions (1)	Gross Toll Revenue \$Millions	Average Daily Transactions (1)	Gross Toll Revenue \$Millions	
2035	46,875	422.3	21,123	699.0	1,121.35
2036	47,811	431.6	21,536	712.8	1,144.40
2037	48,760	440.9	21,955	726.8	1,167.79
2038	49,723	450.5	22,381	741.1	1,191.54
2039	50,701	460.1	22,813	755.5	1,215.64
2040	51,150	489.5	22,951	809.2	1,298.74
2041	52,158	500.0	23,397	825.1	1,325.05
2042	53,180	510.6	23,848	841.1	1,351.76
2043	54,218	521.4	24,307	857.4	1,378.87

- (1) Average number of transactions in both directions along the entire I-81 Corridor. Number of daily trips may be significantly higher in segments near urban areas and significantly lower in more rural areas.
- (2) The Fluor Finance Plan assumes tolls will not be imposed until 2012 and will be at 50% of the rates assumed in the Vollmer analysis for the first two years of operation.

D.1 Construction and Design Issues

Describe commitments and plans to use local contractors and consultants.

As stated in the October 2 presentation, Fluor Virginia is committed to the use of Virginia based contractors and suppliers. In an area such as the Shenandoah Valley where resources are limited, it is imperative to maximize the use local resources to ensure success. The Fluor team stands ready to subcontract 30 – 40 percent of the work to these local resources. As would be expected, specialty contracts such as paving, electrical, guardrail, etc. will be subcontracted. The table below identifies anticipated subcontract opportunities.

Construction Subcontract Opportunities

Work Description	
Concrete Paving	Pavement Markings
Concrete Flatwork	Traffic Control
Signs	Landscape
Asphalt Paving	Surveying
Fencing	Professional Services
Coatings and Painting	Design Work
Erosion Control	Construction Services

The Fluor team is also committing to subcontract portions of the work to local general grading and structure contractors. These contractors would be integrated into our work plans as dedicated team members. During this subcontracting, we would identify areas that could be targeted for DBE set asides in support of our commitment on meeting or exceeding the established goal of 12.0 percent for DBE participation.

In addition to the general contractors, the Fluor team will be looking to subcontract portions of the design efforts and construction supports efforts. This would be in the areas of surveying, construction staking, geotechnical investigations, inspections, select portions of the detail design, and utility coordination.

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D.2 Construction and Design Issues

Describe what percentage of your proposal includes a grassed or landscaped median strip.

A major design principle guiding our project development is to minimize the impact to the environment by widening to the inside and by minimizing the footprint used at the interchanges. The inside widening allows for 54 percent of the corridor to maintain a grassed median without a center barrier, and another 19 percent of the corridor requiring a barrier, but may still have some green space.

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D.3 Construction and Design Issues

Describe phasing and segmentation plans. How will or can these be modified to account for NEPA requirements for logical termini and independent utility? Does your financing plan allow flexibility to modify phasing and segmentation plans?

The proposal uses three design-build lead contractors working in three locations within the corridor simultaneously. The corridor is currently split into 15 segments each approximately 20 miles in length. These segments were chosen based on being defined as rural or urban by the Department and FHWA. The assumption was that the rural segments would have the ability to receive environmental approval more quickly than the urban segments. Thus these segments were scheduled first, in order to expedite the construction process and minimize the construction duration and impacts to the traveling public. These termini can be modified as needed to account for the NEPA requirements as it related to logical termini and independent utility. The financing plan is based on the overall construction duration taking eight years. If this duration changes, the financing would need to be reviewed and modified, up or down, with the intent to minimize the cost to the traveling public. Thus the finance plan can be modified as needed to fit the phasing and segmentation.

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E.1 Finance/Administration

Describe all warranties, guarantees, and assumptions of project risk in your proposal.

Fluor Virginia, Inc. (“FVI”) will be the prime contractor on the project and will guarantee completion for a fixed price, subject to the terms and conditions of the Comprehensive Agreement. FVI’s performance will be backed up by an ultimate parent company guaranty from Fluor Corporation.

The three segment design builders, FVI, Gilbert Southern and Granite, will each provide bonds for the design and construction of their portion of the work. These bonds will be provided with dual obligee riders in favor of both FVI and the Commonwealth of Virginia. The segment design builders will also back up their performance with credit- worthy guaranties.

Warranties and guaranties of workmanship from the segment design builders will run in favor of the Commonwealth of Virginia in addition to FVI, its prime contractor.

Operations and Maintenance will be secured via the bonds and parent guaranties of VMS, FVI’s maintenance contractor. Those bonds and guaranties will run in favor of both FVI and the Commonwealth.

The bond amounts and durations (for all aspects of the project) will be established taking into consideration current surety market conditions at the time the bonds are to be placed.

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E.2 Finance/Administration

Describe any highway or rail “non-compete” clauses or other provision that would limit the ability of the Commonwealth, corridor localities or railroads from undertaking any type of transportation improvements or cause such an improvement to have an impact on this project.

Fluor has **not** stipulated any highway or rail “non-compete” clauses or provisions that would limit the ability of the Commonwealth, corridor localities or railroads from undertaking any type of transportation improvements or cause such an improvement to have an impact on this project.

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E.3 Finance/Administration

Describe the factors influencing your proposed toll implementation date, specifically addressing whether this date is based on levels of completed construction or is fixed due to restrictions in the plan of finance.

The Fluor plan of finance does not rely on early imposition of tolls to fund capital costs. We do propose to impose tolls after significant improvements are completed in order to reduce the amount of borrowing and the ultimate cost to the users. The date of implementation and level of tolls charged is flexible and adjustments can be considered to meet VDOT objectives. Our current toll assumptions for the initial years of operation are summarized in the table below.

	CARS	TRUCKS
Prior to January 2012	No Tolls	No Tolls
2012 and 2013	\$0.025 per mile	\$0.085 per mile
2014	\$0.05 per mile	\$0.17 per mile

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E.4 Finance/Administration

Describe legislative strategy and timing for securing passenger car tolling authority from the Commonwealth in the corridor.

The Fluor team has adopted a comprehensive strategy in support of the tolling of cars by the General Assembly. Fluor plans to submit legislation to toll cars on I-81 during the 2004 Session of the General Assembly.

Fluor is in the middle of a two phased approach to gain passage of legislation allowing the tolling of cars. During the months of September and October, Fluor and its representatives met with members of the General Assembly to educate them about the Fluor proposal, including its financing plan. During the months of November and December, Fluor and its representatives will be meeting with the members of the General Assembly (and, in fact, such meetings have already begun) to gain commitments for such legislation. Based on our conversations so far, Fluor is confident that a majority of General Assembly members will support the tolling of cars. Fluor will be happy to discuss the results of these conversations with the Advisory Panel and its staff.

Fluor recognizes that the tolling of cars is more than just a vote of the General Assembly in the 2004 Session; it is an issue of community support. Fluor has implemented a comprehensive plan of public outreach to gain support for the tolling of cars. Fluor has a team of individuals that live and work in the I-81 corridor traveling through the corridor meeting with local community leaders, businesses and local elected officials to explain the benefits of the Fluor plan and the necessity to toll cars in order to finance improvements to I-81. Likewise, Fluor has advocates meeting with members of the General Assembly who will likewise secure their support.

To date, Fluor has accomplished the following:

- Fluor has met with each of the major media outlets in the I-81 corridor to inform them of Fluor's proposal and to answer questions.
- Fluor has held numerous regional information meetings for residents of the community to learn about the Fluor proposal and to ask questions.
- Fluor has visited members of the General Assembly throughout the corridor to explain the Fluor proposal, to discuss the need for tolls and to answer questions.
- Fluor representatives have also met with the leadership in the House of Delegates and the Senate of Virginia to discuss the Fluor proposal and to discuss the need for tolls on cars.
- Fluor advocates are also meeting with members of the General Assembly one-on-one.

Continuing Activities

- Fluor will continue to meet with major media outlets in the I-81 corridor, to hold regional information meetings for area residents and to visit with members of the General Assembly throughout the state to explain the benefits of the Fluor proposal and the wisdom of tolling cars.

- Fluor will continue to build support along the I-81 corridor and throughout the state for the Fluor proposal, including the tolling of cars.

Session Strategy

- At the appropriate time, the patrons and co-patrons of the legislative actions needed to toll cars will be announced and the appropriate legislative actions initiated.
- Fluor will ensure the legislation is bi-partisan.
- Fluor will shepherd the legislation throughout the process providing talking points, information, testimony and aggressive lobbying to ensure passage of the legislation.

Results

- Fluor is confident that the General Assembly will approve the tolling of cars.
- Most members of the General Assembly have informed Fluor's representatives that they do not oppose tolling cars. Thoughts expressed by members of the General Assembly include the following:
 - The only way to assure appropriate funding for I-81 improvements is through the imposition of tolls.
 - Tolls should be paid by all beneficiaries of the I-81 improvements, i.e., all users of the road should pay the tolls, both cars and trucks.
 - Tolling only trucks will have a very negative impact on manufacturers, distributors, local businesses, trucking interests and economic development in the I-81 corridor and throughout the state.
 - Tolling both cars and trucks allows for more reasonable rates for all beneficiaries of I-81 improvements.
 - The Fluor plan for tolling allows much more reasonable rates than those of its competitor on trucks (17 cents per mile vs. 37 cents per mile) and cars (five cents per mile vs. six cents per mile), with such tolls commencing later (2012 vs. 2007) and concluding earlier (2048 vs. 2054).
 - Even with the imposition of tolls, there are alternative free routes for use by local residents.
 - The Fluor plan provides for free and reduced rates for local trips, discounted frequent user rates and a flexible tolling schedule beneficial to local residents and businesses.
 - It is unlikely that the Commonwealth will receive \$1.6 billion from the federal government because (i) receipt of such monies is contingent upon a commitment by VDOT to physically separate cars and trucks which cannot be made at this time as the NEPA process is just commencing and (ii) the \$800 million being sought in each of the next two re-authorizations is unrealistic in light of the fact that the average earmark during the last two re-authorization bills has been in the range of \$11 million and \$5 million.

E.5 Finance/Administration

Describe and provide cost estimates for toll enforcement in the corridor, including a description of any necessary legislative actions, the strategies for accomplishing these actions and how your proposal envisions funding this enforcement.

Presently, violation enforcement in the state falls under the jurisdiction of the Virginia court system. The failure of a patron to pay a toll is illegal although enforcement is not a function of the local or State police. Toll violations are not considered as “moving violations” and therefore police can not stop a vehicle and issue a summons/ticket for a violation. However, the vehicle can be stopped to obtain vehicle and driver information and that information can be forwarded to the violation processing authority.

Our tolling contractor, Raytheon will be responsible for operation of the video tolling system that includes the violation processing system. Raytheon will provide the video tolling risk which includes higher fees for non-transponder equipped vehicles. Patrons that fail to pay their tolls will be processed through the court system. Electronic transactions for transponder equipped vehicles will be collected at the video processing facility and forwarded to the state’s Smart Tag customer service center for processing. Typically transponder account holders are not considered as violators since their accounts can be accessed by the Customer Service Center and funds adjusted for violations. Typically these include items such as early/late reads, missed reads, axle mismatches, transponder weak batteries, and etc.

The tolling philosophy on I-81 will not be axle based and therefore, for transponder equipped vehicles, the fare is based upon the vehicles transponder classification. For non-transponder equipped vehicles (video tolling), classification is determined by the gantry mounted laser unit. Cars and trucks will pay a fixed toll rate per mile based upon their vehicle classification.

The Fluor Virginia proposal requires vehicles to be tolled to pay for the highway improvements. It only makes sense that the users pay for the improvements. Present legislation allows for the tolling of trucks but does not include cars. New legislation will have to be introduced and passed to include the tolling of cars. We are working with members of the general assembly to introduce this new legislation.

Some states have given the state police the authority to issue summons/tickets to toll violators. Fluor Virginia encourages Virginia to enact stricter toll enforcement legislation to benefit, not only the I-81 corridor, but for all toll facilities in the state. The current enforcement laws are weak and allow for revenue losses. The State should consider linking the non-payment of violations to the vehicle’s registration renewal. This would provide the toll authority an avenue to collect delinquent violation revenue. The state should also consider allowing direct access to DMV databases for obtaining vehicle ownership information. The state should also consider establishing reciprocity agreements with other states to obtain DMV information for out-of-state vehicles with non-Virginia license plates. These systems and others have been used in other states and proven to be effective in recovering violation revenue. For vehicles with transponders,

vehicle and license plate information is available through the E-ZPass system. For vehicles without transponders, this information must come from the DMVs.

Our tolling plan includes a Real Time Enforcement system to be installed at several points along the corridor. At key points, the image capture system will detect, classify and bill vehicles without transponders. This system will use a database of repeat offenders of the highway and can notify the police of the violation via a wireless communications system. This action can be processed within minutes of the violation and police notified to be on the alert for the vehicle in question. This system includes sending a notification alert and the image of the violator to an onboard computer in the police vehicle. This is a current technology and used on E407 in Canada.

The Fluor Virginia team is investigating several enforcement options for the I-81 corridor. These include using local and state police to supplement the enforcement system as well as private enforcement.

The Fluor Virginia proposal includes a budget for enforcement and revenue recoveries as part of the video tolling and violation processing operation. The violation-processing center (back room) will be responsible for revenue collections for the video tolling customers. In addition, the center will be responsible for violation processing (image processing), violation notification, and collection of non-paid toll revenue.